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PREFACE

In connection with our continuing studies on manpower requirements for economic growth we have undertaken a number of research projects. Among these are the preparation of historical indexes of output by industry for Ontario. This report, outlining the methodology used in the preparation of the indexes of health and education, is one of a group of reference papers supplementing the reports in the series of projections on trends in job families, output, employment and productivity.

The research was carried out and this paper prepared by Miss Catherine Goodman in collaboration with Mrs. Helen Salisbury in the Economic Planning Branch, Department of Treasury and Economics. The findings in these studies are being used as a basis for projection of output in the health and education industries and are being integrated with employment and productivity projections.

C.P. Honey,
Director,
Economic Planning Branch.

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An Index of Output for
Human Resource Development Industries

I Introduction

Education and health expenditures are becoming an increasingly sizeable item in the Gross National Product. Total expenditures on these two items grew from 7.5 per cent of G.P.P. in 1959 to about 11 per cent of G.P.P. in 1967.⁽¹⁾ The growing importance of the "human resource development industries" is expected to continue as more emphasis is being placed on the value of investment in human capital.

No attempts have been made to date to measure productivity in these industries, nor to establish medium- and long-term employment requirements in health and education in Ontario. A prerequisite to measuring productivity and determining employment requirements is the existence of input and output data for the industry. Input data for these industries are readily available: the number of doctors, nurses, hospital personnel, teachers and capital assets employed in these industries in Ontario. However, there is a need to determine the output of these industries. The Dominion Bureau of Statistics has published Indexes of Real Domestic Product by Industry⁽²⁾, which includes indexes for the service industries. For such services as government, schools, and hospitals, the index is based on employment, and thus measures input rather than output⁽³⁾, on the assumption that productivity is constant.

(1) Estimated by the Economic Planning Branch, Department of Treasury and Economics.

(2) Canada, Dominion Bureau of Statistics. Indexes of Real Domestic Product by Industry. (61-506). Ottawa: Queen's Printer, 1968.

(3) D.B.S. are currently revising their indexes for the service industries to be more in line with a measure of output.

This report is an attempt to estimate the output of the health and educational industries on a more realistic basis. A number of difficulties are encountered in estimating the output of the service industries, particularly in the health service industry. The output of the manufacturing sector can easily be defined: the automobiles, refrigerators, houses, etc., that are produced. But what constitutes the output of the health industry? Is it the number of appendectomies and tonsillectomies produced, the services rendered by medical personnel, or simply the good health produced in the population? Any one of these definitions is acceptable, and the final choice will depend on the use to which the output index will be put.

II Output of the Health Industry

There are a number of ways of defining the output of the health industry. Good health like education is partly an investment good and partly a consumption good, and it is difficult to determine how much of health expenditure is for consumption and how much is an investment. Clearly, good health is an end in itself and people do "purchase" medical services to enjoy a long and healthy life. On the other hand, investment in health yields a rate of return in the future to both the individual and society. The rate of return is the increase in wages due to investment in health.

It is useful to look at the output of the health industry from both points of view: as an investment, and as a consumption good.

As a pure investment, the output of the health industry may be defined as the increase in production (or earnings) which can be attributed to investment in health. This could be measured by the increase in man-hours of work due to health investment multiplied by the average productivity per man-hour (or, in the case of earnings, multiplied by the average wage rate). This measure of output assumes that all those whose working ability was restored would enter the labour force and become employed. Some adjustments would have to be made to this measure of output using participation and unemployment rates in order to get a measure of those who actually do become employed.

As a consumption good the output of the health industry can be defined as the increase in the average age at death. This measurement would not be as satisfactory as the "increase in earnings" measure as it does not reflect any general decrease in the incidence of non-fatal illness.

Both the "increase in earnings" and "increase in age at death" measures can be criticized because changes in death rates cannot be solely attributed to the medical care industry. Such environmental factors as improved sanitation and better water supplies have contributed greatly to decreasing the death rate, whereas the increased use of industrial equipment and the automobile have significantly increased the number of deaths.

Still another way of defining the output of the health services industry is the one suggested by Reder. He would define medical care as "that which is provided for an individual who has membership in (say) a particular comprehensive prepaid medical care plan".⁽⁴⁾ As a measure

of output for the particular plan, this may be satisfactory, but to use this measure for the province (or country) as a whole problems of data collection become enormous due to the many and varied plans presently in effect. However, with the implementation of a nation-wide comprehensive medicare scheme, this concept should be examined.

The indexes of output for health and education presented in this report were prepared as part of a larger study which is projecting output, productivity and employment requirements for all sectors of the Ontario economy. It was therefore necessary to make the indexes for the service industries comparable to the existing output indexes for the manufacturing sector, which are computed on a national accounting basis. The measure of output that was chosen was "a specified basket of medical services".⁽⁵⁾ The criticism aimed at this approach by Reder, Klarman and others⁽⁶⁾ that this measure is too close to an input measure, can be circumvented by measuring not the number of man-hours of service of medical personnel, but by adding together the constant-dollar value of the various types of services they perform, i.e., the number of appendectomies, tonsillectomies, medical examinations, units of laboratory services, etc. One does, however, run into problems with the hospital

(4) Reder, M.W. "Some Problems in the Measurement of Productivity in The Medical Care Industry", in V.R. Fuchs, (ed.) Production and Productivity in the Service Industries, (National Bureau of Economic Research. "Studies in Income and Wealth Series", Vol. XXXIV). New York: Columbia University Press, 1969, p.99.

(5) Klarman, H.E., "Some Problems in the Measurement of Productivity in the Medical Care Industry, Discussion", in ibid, p. 135.

(6) Reder, M.W. "Some Problems in the Measurement of Productivity in the Medical Care Industry, and Discussion", in ibid, pp. 95-153.

care component, as hospital services are not so clearly defined as medical services. Nurses and other hospital personnel perform no clearly defined service, as far as measurement is concerned, and thus their output is difficult to establish. We therefore had to use constant-dollar value of the number of patient-days in hospitals.

This "bundle of medical services" approach would therefore seem to be satisfactory as an output measure for the health industry, as it does make possible an evaluation of the efficiency of inputs through time. It does not, however, take into account any changes in the quality of the services provided. This study has made no attempt to adjust the output index for changes in the quality of health services. The index will, therefore, probably have a downward bias due to the improved quality of medical services in recent years. Some effort should be taken to investigate this. Reder⁽⁷⁾ has suggested that changes in age-specific death rates are indicative of the changing quality of medical care and that this could be used to adjust the output figure. This is a possibility. However, as noted above⁽⁸⁾, decreases in the death rate cannot be solely attributed to improved quality of health care. Some research should be attempted to determine the degree to which the improved quality of health care has contributed to decreasing the death rate. It would then be possible to adjust the output figure for changes in the quality of medical services.

(7) ibid, pp. 100 ff.

(8) p.3

III Output Index of Health Services in Ontario, 1959-1967

The output of the health services industry was broken down into five main groups;⁽⁹⁾

- medical care (doctors' visits)
- hospital care (patient-days)
- surgical procedures
- laboratory services
- radiology examinations

Data were collected on the volume of each service and weighted by an estimate of the market price of the service in 1967 in order to obtain an estimated constant-dollar value of output. The index of output has been computed for the years 1959 to 1967. No attempt was made to compute an output index prior to 1959 due to discontinuities in or complete lack of data. Moreover, the index of output for the years 1959 and 1960 does not include surgical procedures as data prior to 1961 was unavailable.

Medical Care

This component consists of doctors' services, exclusive of surgery. It includes home calls and hospital calls by physicians, office calls, consultations and psychiatric treatment. At present there is no data available on the volume of medical care (as defined in this report) in the province. Estimates were therefore made using data made available by Trans-Canada Medical Plans. The volume of medical care was estimated by using the per capita utilization figures of the Windsor

(9) For the type of service included in each group see the statistical appendix, pp. 18ff.

Medical Services Inc. and the Physicians' Services Incorporated plans. Population coverage in the Windsor Medical Services Plan would appear to be fairly representative of the Ontario population. Windsor Medical Services covers the two counties of Essex and Kent and includes 80-85 per cent of the population of these two counties. Moreover, the age distribution of the population enrolled in Windsor Medical Services is quite similar to that of the Ontario population. It was assumed⁽¹⁰⁾ that utilization rates for the provincial population would be the same as for those enrolled in the Windsor Medical Plan for purposes of estimating the volume of medical care in Ontario. P.S.I. utilization figures were used for some of the services in the medical care component (night, holiday, emergency calls, well-baby care, refractions, psychiatric treatment) as there appeared to be discontinuities in the coverage of these services by Windsor Medical.

The volume of medical care was weighted by an estimate of the 1967 market price of the particular service in order to obtain a constant-dollar value of output. The figure that was used for weighting was the average amounts paid by PSI to member doctors in 1967.

(10) The implementation of a comprehensive centrally administered medicare program in Ontario should provide reliable utilization data in the future. This report has made no attempt to determine the direction of bias of the historical estimates of the volume of medical care. An upward bias would be introduced if the view is correct that people enrolled in comprehensive medical plans use medical services more frequently than those who have no coverage. On the other hand, the plan may limit the amount of services available to a subscriber and this would underestimate the actual amount of medical services provided to the population. This problem, however, is not too serious when computing an index, so long as the bias remains constant throughout the historical series.

Hospital Care

The number of patient-days of hospital care was used as a measure of output for this component of the index. Data was obtained from the Annual Report of the Ontario Hospital Services Commission on the number of patient-days in all private and public active-treatment hospitals, convalescent and chronic hospitals, and federal hospitals. Data on mental institutions was obtained from the Dominion Bureau of Statistics publication, Mental Health Statistics (Vol. II) Patients in Institutions (183-208). Hospital operating costs per patient-day in 1967 were used to weight the output figures.

Surgical Procedures

Data on the seventeen most common operations for the years 1961-1967 was obtained from the Ontario Hospital Services Commission. These were weighted by the 1967 fees charged for the various medical procedures (Ontario Medical Association, Schedule of Fees, 1967) to obtain a constant-dollar value of surgical operations.

Radiology and Laboratory Services

Data on the number of units and the 1967 cost per unit of laboratory service and the number of radiology examinations and the 1967 cost per examination were obtained from the Annual Report of the Ontario Hospital Services Commission.

TABLE I

Index of Output of Health Services,
Ontario 1959-1967

<u>Year</u>	<u>Medical Care</u>	<u>Hospital Care</u>	<u>Surgical Procedures</u>	<u>Laboratory Services</u>	<u>Radiology Services</u>	<u>Total Health</u>
Weights	0.186	0.689	0.034	0.044	0.047	1.000
1959	69.8	80.8	--	29.0	57.3	75.3
1960	73.4	84.9	--	35.5	60.4	79.3
1961	77.8	88.2	84.7	40.2	64.3	83.0
1962	81.8	89.3	84.4	46.1	72.2	85.0
1963	87.9	91.3	88.8	54.0	70.3	87.9
1964	90.9	96.5	91.2	62.6	77.4	92.9
1965	94.8	97.8	90.0	71.9	84.7	95.3
1966	98.5	98.0	95.0	83.8	90.9	97.0
1967	100.0	100.0	100.0	100.0	100.0	100.0

IV Output Index of Educational Services in Ontario, 1950-51 to 1968-69

Education, like health, is partly an investment and partly a consumption good and again difficulties are encountered when trying to define the output of this industry. Educational output may be defined in a number of ways. From the individual's point of view, he may "purchase" education for present satisfaction. He may enjoy the process of learning as well as the social and cultural benefits of the educational environment. On the other hand, individuals "purchase" education in order to expand their knowledge and their capacity to enjoy life for both social and economic gains in the future. From the point of view of society as a whole education ensures an enriched social structure as well as a more productive work force.

The definition of educational output is further complicated by the fact that education is compulsory up to age sixteen. After this age, if students choose to remain in school they are clearly deriving some satisfaction from it. But at earlier ages it is difficult to determine whether a student gains satisfaction from schooling. There will be a return to parents because compulsory education of children frees them from teaching duties and at least in the very early ages provides a baby-sitting service for mothers.

How does one measure such benefits from education? The task is to try to develop some measure that will take account of all the diverse benefits derived from education. An analysis of the output of education from the point of view of both consumption and investment will help us to understand the nature of educational output and thus aid us in developing some measurement for it.

As a consumption good educational output can be defined as the satisfaction which students have gained from learning and from the whole mix of activities and interests arising from the school environment. If we ignore the economic and social pressures which may force students to stay in school we could assume that the aggregate consumption factor is equivalent to the time spent in school multiplied by the number of students. This is based on the assumption that there is no difference in the degree of satisfaction derived by the consumer at each level of education. In the economist's jargon, educational consumption exhibits constant marginal utility.

When education is viewed as an investment good, however, there is no basis for assuming constant marginal utility or returns. One has to establish the returns to educational investment and weight the output (school enrolment at each level of education) accordingly.

Returns to educational investment vary depending on the educational mix of the society, labour force participation, and the age of the population in whom the investment is being made. In a country such as India, for example, the social return to investment in elementary education is likely to be much higher than the return to investment in university education.

There has been some recent debate in Canada regarding the returns to educational investment in this country. Professor D.A. Dodge of Queen's University in a recent study reports that the government may be throwing away money by investing in universities.⁽¹¹⁾ He estimates the return to

⁽¹¹⁾ "Queen's economist urges freeze on University Spending", Globe & Mail, September 26, 1969.

educational investment in the form of increased GNP to be only about $3\frac{1}{2}$ per cent.⁽¹²⁾ This is in contrast to the traditional view that investment in higher education is a profitable business. Miss J.R. Podoluk of the Dominion Bureau of Statistics has estimated that in Canada the private rate of return is slightly higher for investment in university education than it is for investment in secondary school education.⁽¹³⁾ Some research is needed to determine the social rates of return to investment in education at each level, before one can determine the "value" of educational output to society.

The returns to investment in education would be measured in much the same manner as the returns to health investment - the increase in earnings or production which can be associated with the investment in education. This would be measured by the differences in earnings for various levels of education. For example, the returns to investment in one year of university education for one individual would be the discounted value of the difference in the average earnings of persons with one year of university and the average earnings of grade thirteen graduates over the working life span of the individual. The number of students that complete a given level of education weighted by the net gain in earning power over the working life of the individual would then serve as a measure of the investment component of the output of the educational industry.

(12) "Dodge says university spending report distorted", Varsity, October 1, 1969.

(13) J.R. Podoluk, "Earnings and Education", D.B.S., December, 1965.

Because of the difficulty in measuring all these cultural and social values of education a fairly simplified procedure was chosen to develop an index of educational output. Moreover, the output index had to fit into a national accounting framework so that it would conform with the output indexes for manufacturing. This factor made the problem of valuing a year of schooling fairly easy to resolve. Assuming that the return to all individuals is equal, the measurement of output that was used was the student enrolment per year weighted by per-student operating costs, as these figures were readily available. No account was taken of opportunity costs or foregone income at the post-secondary level, which will underestimate the output at this level. However, since the output is in the form of an index the omission is not too serious. A further and more serious omission in the output index presented is that we have not yet attempted to adjust for quality changes in educational output.

The sectors that were included in educational output are as follows:

- a) elementary school
- b) secondary school
- c) university - undergraduate
 - graduate
- d) technology and trade schools which were incorporated into the Colleges of Applied Arts and Technology in 1967.
- e) teacher training at the non-university level. (Secondary school teacher training is included in university enrolment.)
- f) Ontario College of Art
- g) private trade schools and business colleges.

The output index was computed for full-time enrolment in the above institutions with some adjustments being made for short-term apprenticeship courses. Part-time enrolment (evening and summer courses) was not included as these figures were not available for all institutions.

The output index was computed for the years 1950-51 to 1968-69. Enrolment data for private trade schools and private business colleges were unavailable prior to 1959-60, so this sector was not included in the index prior to this date.

TABLE II

Index of Output of Educational Services, Ontario, 1950-51 to 1968-69

Year	Elementary School	Secondary School	University		Private Trade Schools	Private Business Colleges	Tech. Schools or Community Colleges	Teachers Training	Ontario College of Art	Total Education
			Undergraduate Full Time	Graduate Full Time						
Weights (1966-67)	.4792	.2817	.1853	.0261	.0039	.0021	.0158	.0053	.0006	1.0000
1950-51	44.9	30.1	30.7	25.1	-	-	8.2	26.1	52.8	36.8
1951-52	48.0	30.6	32.0	17.5	-	-	10.9	24.9	40.1	38.6
1952-53	52.2	32.4	31.8	16.2	-	-	13.7	28.7	34.6	41.1
1953-54	56.3	34.1	31.3	17.1	-	-	14.7	26.5	33.5	43.5
1954-55	60.2	36.7	33.6	17.3	-	-	16.0	41.2	32.9	46.6
1955-56	63.3	40.0	34.6	20.1	-	-	24.1	48.0	36.2	49.5
1956-57	66.8	42.6	36.5	20.8	-	-	25.9	52.7	41.2	52.3
1957-58	71.2	46.7	39.1	23.6	-	-	27.4	55.8	42.6	56.2
1958-59	75.3	50.9	42.3	26.4	-	-	30.0	71.7	50.5	60.2
1959-60	79.2	54.5	44.7	28.6	82.3	120.2	29.9	91.1	64.8	63.9
1960-61	82.5	60.3	48.5	33.6	46.6	132.6	33.1	103.0	62.6	67.9
1961-62	85.2	68.6	54.2	37.6	118.1	124.9	44.4	92.7	67.0	73.1
1962-63	87.7	76.0	59.1	43.1	91.5	143.8	46.9	84.4	77.6	77.4
1963-64	90.4	83.5	65.7	54.4	130.8	135.2	52.7	98.1	90.0	82.6
1964-65	93.7	90.7	74.5	70.2	131.1	125.8	68.4	98.9	93.0	88.5
1965-66	96.7	96.0	85.6	88.8	97.9	118.8	79.1	90.5	97.9	94.0
1966-67	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1967-68	102.9	106.4	113.9	126.6	-	92.3	165.2	104.9	107.9	107.5
1968-69	104.6	116.0	133.2	148.8	-	-	240.7	107.7	-	116.4

APPENDIX A

Method of Computing Index

Indexes of output for the major components as well as an index for the total industry were computed. The base period for hospital services is 1967. That for educational services is 1966-67. The following formula was used to obtain the index in year j for each of the major components:

$$\frac{p_{ib} q_{ij}}{p_{ib} q_{ib}}$$

Where p_{ib} = price of service i in the base year

q_{ij} = volume of service i in year j

q_{ib} = volume of service i in the base year

To obtain the index for the total industry, base year proportions were used as weights:

$$\sum_i \frac{p_{ib} q_{ij}}{p_{ib} q_{ib}} \times \frac{p_{ib} q_{ib}}{\sum_i p_{ib} q_{ib}}$$

This reduces to:

$$\frac{\sum_i p_{ib} q_{ij}}{\sum_i p_{ib} q_{ib}}$$

APPENDIX B

STATISTICAL TABLES

TABLE B-1

Estimated Number of Medical Services, Ontario¹

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Home Calls (day) (WMS)	2,726,779	2,545,805	2,523,335	2,487,173	2,699,545	2,330,151	2,162,738	1,769,208	1,446,460
Each Additional Family Member (WMS)	313,373	284,592	202,795	214,305	228,881	170,499	191,843	165,393	131,651
Night, Holiday, Emergency (PSI)	388,089	400,646	425,794	390,973	408,381	363,516	336,954	334,128	294,728
Office Calls (WMS)	14,919,302	15,396,797	16,133,779	17,154,424	17,613,669	18,656,760	19,497,435	20,437,774	21,014,865
Hospital Calls (WMS)	3,270,829	4,037,510	4,580,467	5,005,838	5,820,012	5,998,022	5,997,130	6,016,810	6,236,001
Consultations (WMS)	515,759	610,579	712,401	879,497	901,416	985,194	1,066,065	1,243,791	1,290,178
Well-Baby Care (PSI)	421,457	453,130	471,442	456,263	510,280	526,777	510,760	479,474	471,395
Refractions (PSI)	372,856	364,426	376,405	214,305	435,815	478,523	509,121	558,829	610,690
Psychiatric Treatment (PSI)	157,412	206,237	234,972	241,190	278,263	339,389	597,663	658,232	684,584
Shock Treatment (WMS)	14,508	17,002	23,198	23,812	22,731	28,148	28,694	37,589	39,071

1. Estimated from the utilization figures of the Physicians' Services Incorporated and the Windsor Medical Services Inc.

It was assumed that per capita rates of medical services for the total provincial population are the same as those for the population enrolled in the medical plans.

Source: Trans-Canada Medical Plans. "Annual Enrolment Experience & Annual Financial & Statistical Experience Report", 1959 and subsequent years, (unpublished).

TABLE B-2

Ontario Hospital Care
(Number of Patient Days)

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Hospital Care	10,921,811	11,555,922	12,053,915	12,582,236	12,993,826	13,482,310	13,805,787	14,000,953	14,370,377
1. Active Treatment	8,398,832	8,829,411	9,222,579	9,530,187	9,926,014	10,280,590	10,492,645	10,734,886	11,176,201
2. Convalescent	131,695	132,601	138,678	194,564	218,236	245,907	293,106	308,571	307,540
3. Chronic	1,620,861	1,973,423	2,126,044	2,204,802	2,215,681	2,325,622	2,379,010	2,408,221	2,521,360
4. Federal Hospitals	770,423	620,487	566,614	652,683	633,895	630,191	641,026	549,275	365,276
5. Mental Institutions	8,262,312	8,609,395	8,866,364	8,102,287	7,850,364	8,953,803	8,764,219	8,262,698	8,083,107

Source: Ontario Hospital Services Commission: Annual Report (Statistical Supplement), 1959 and subsequent years.Canada Dominion Bureau of Statistics: Mental Health Statistics (Vol. II) Patients in Institutions '83-208),
Ottawa: Queen's Printer, 1959 and subsequent years.

TABLE B-3

Ontario Surgical Procedures
(Number of Operations)

	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>
Operations								
Tonsillectomy & Adenoids	59,788	62,256	64,520	64,863	63,013	67,326	67,818	62,965
Tonsillectomy without Adenoids	16,694	12,688	16,750	16,829	16,349	17,467	17,841	17,749
Dilation & Curettage of Uterus	23,832	26,450	25,643	25,482	24,982	26,619	28,536	28,872
Cholecystectomy	10,012	10,326	11,538	12,993	13,656	15,227	18,161	19,707
Hernia	16,049	16,275	17,263	17,860	18,359	18,710	18,797	18,785
Appendectomy	20,661	19,671	19,489	19,272	17,439	17,206	17,376	17,065
Episiotomy without Forceps	10,282	13,254	12,444	11,568	11,613	13,191	14,899	15,167
Dilation after Delivery	19,000	19,166	18,715	18,555	16,285	15,276	14,737	14,643
Excision of Lesion of Skin	10,005	8,393	8,046	8,696	8,913	9,491	9,574	9,597
Extraction of Tooth	7,027	7,007	7,012	7,647	7,683	8,023	8,757	9,595
Delivery with Episiotomy	6,750	7,107	7,139	6,982	6,848	8,988	9,416	9,250
Delivery without Episiotomy	9,649	11,687	10,792	10,488	9,892	9,239	9,277	9,141
Excision of Varicose Veins	5,784	6,188	7,273	7,581	7,842	8,032	8,407	8,904
Hemorrhoidectomy	6,107	5,919	6,393	7,017	7,000	7,116	7,514	7,526
Hysterectomy (complete)	6,072	5,591	6,495	6,436	6,221	6,975	7,139	7,321
Prostatectomy (transurethral)	4,031	3,989	4,488	4,936	4,943	5,126	5,529	6,028
Cesarean Section	5,429	3,793	4,467	4,911	4,939	4,856	4,983	5,305
Suture	7,604	6,144	5,902	5,468	5,355	5,422	4,941	4,861
Partial Mastectomy	3,942	3,903	3,705	3,762	4,014	4,228	4,637	4,548

Source: Ontario Hospital Services Commission: "Separations and Corresponding Rates for the Twenty-Five Most Common Operations for Provincial Plan In-Patients" (Unpublished), 1959 and subsequent years.

TABLE B-4

	<u>Ontario Radiology Services</u> (Number of Examinations)								
	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Volume of Diagnostic X-Rays	1,669,553	1,743,627	1,859,225	2,093,368	2,037,341	2,244,305	2,460,305	2,643,826	2,914,889
Volume of Therapeutic X-Rays	86,288	128,349	128,989	129,592	132,159	140,862	139,947	142,786	146,165

ONTARIO LABORATORY SERVICES
(Units of)

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Active Treatment	20,146,009	24,738,435	27,956,817	32,082,398	37,553,422	43,495,591	49,959,239	58,254,214	69,556,840
Chronic and Convalescent Treatment	123,384	131,930	153,967	174,835	216,337	285,332	338,068	385,163	426,336

Source: Ontario Hospital Services Commission: Annual Report (Statistical Supplement), 1959 and subsequent years.

TABLE B-5

Average Amounts Paid By P.S.I.
to Member Doctors, 1967

Home Call	\$ 6.23
Each Additional Family Member	2.90
Night, Holiday, Emergency Call	9.20
Office Call	4.31
Hospital Call	3.43
Consultation	18.77
Well-Baby Care	4.62
Refraction	12.52
Psychiatric Treatment	8.58
Shock Treatment	13.66

Source: Trans-Canada Medical Plans, "Annual Enrolment Experience
& Annual Financial and Statistical Experience Report," 1967
(unpublished).

TABLE B-6

Fees Charged for Surgical Procedures - Ontario, 1967

Tonsillectomy	\$ 65.00
D & C	65.00
Cholecystectomy	243.00
Hernia	149.00
Appendectomy	145.00
Episiotomy	35.00
Dilation after Delivery	30.00
Excision of Lesion of Skin	62.00
Extraction of Tooth	15.00
Delivery	165.00
Excision of Varicose Veins	165.00
Hemorrhoidectomy	110.00
Hysterectomy	268.00
Prostatectomy	275.00
Cesarean Section	250.00
Suture	10.00
Partial Mastectomy	145.00

Source: Ontario Medical Association.
Schedule of Fees, 1967

TABLE B-7

Hospital Operating Costs Per Patient-Day,
Ontario, 1967.

Active Treatment Hospitals	\$ 38.92
Convalescent Hospitals	21.64
Chronic Hospitals	18.98
Federal Hospitals	24.76 (1959-66)
	25.01 (1967-68)
Mental Institutions	13.60

Per-Unit Costs of Laboratory Services,
Ontario, 1967

Active Treatment Hospitals	\$.55
Chronic & Convalescent Hospitals	.59

Costs of Radiology Examinations,
Ontario, 1967

Diagnostic X-Rays	\$ 13.83
Therapeutic X-Rays	6.19

Source: Ontario Hospital Services Commission, Annual Report
(Statistical Supplement), 1967.

Information received from the Dominion Bureau of
Statistics and the Department of Veterans Affairs.

TABLE B-8

Full-Time Enrolment in Ontario Educational Institutions
1950-51 - 1968-69

Year	Elementary School	Secondary School (1)	University Undergrad Full-Time	Grad Full-Time	Private Trade Schools	Private Business Colleges	Tech. Schools/Community Colleges (1)	Teacher Training (1)	Ontario College of Art
1950-51	612,182	131,215	18,677	1,939	-	-	954	1,704	501
1951-52	654,506	133,556	19,495	1,356	-	-	1,275	1,628	381
1952-53	712,892	141,091	19,333	1,252	-	-	1,594	1,873	328
1953-54	768,397	148,744	19,037	1,324	-	-	1,714	1,732	318
1954-55	821,736	160,166	20,442	1,333	-	-	1,869	2,692	312
1955-56	863,614	174,562	21,088	1,554	-	-	2,805	3,139	344
1956-57	911,896	185,605	22,195	1,606	-	-	3,014	3,442	391
1957-58	971,117	203,525	23,805	1,826	-	-	3,195	3,647	404
1958-59	1,027,598	222,075	25,768	2,037	-	-	3,496	4,688	479
1959-60	1,081,649	237,576 (2)	27,194	2,211	2,349	5,119	3,490	5,951	615
1960-61	1,126,388	262,775 (2)	29,501	2,599	1,331	5,645	3,861	6,730	594
1961-62	1,163,053	299,177 (2)	32,968	2,903	3,370	5,316	5,179	6,058	636
1962-63	1,197,029	331,578 (2)	35,941	3,328	2,612	6,120	5,471	5,514	736
1963-64	1,233,164	364,210 (2)	39,990	4,201	3,732	5,757	6,147	6,410	854
1964-65	1,278,473	395,301 (2)	45,369	5,424	3,743	5,357	7,977	6,462	883
1965-66	1,320,043	418,733 (2)	52,124	6,859	2,793	5,057	9,218	5,913	929
1966-67	1,364,871	436,026 (2)	60,862	7,727	2,854	4,257	11,655	6,534	949
1967-68	1,405,052	463,736 (2)	69,307	9,782	-	3,928	19,252	6,853	1,024
1968-69	1,430,590	500,807 (2)	81,091	11,498	-	-	28,052	7,040	-

(1) September Enrolment

(2) Includes pupils enrolled in special courses, occupational programs, etc.

Source: - Ontario. Department of Education. Report of the Minister of Education. Toronto: Queen's Printer, Annual.
 - Ontario. Department of University Affairs. Report of the Minister of University Affairs. Toronto: Queen's Printer, 1967.
 - Canada. Dominion Bureau of Statistics. Survey of Higher Education. Part I: Fall Enrolment in Universities and Colleges, 81-204.
 Ottawa: Queen's Printer, Annual.
 - Canada. Dominion Bureau of Statistics. Statistics of Private Trade Schools, (81-214). Ottawa: Annual.
 - Canada. Dominion Bureau of Statistics. Statistics of Private Business Colleges, (81-213). Ottawa: Annual.
 - Canada. Dominion Bureau of Statistics. Survey of Vocational Education and Training, 81-209). Ottawa: Queen's Printer, Annual.
 - Information received from Department of Education and University Affairs, Toronto.

TABLE B-9

Per Student Operating Costs, Ontario, 1967-68

Elementary School	\$ 430
Secondary School	791
University (Undergraduate)	3,729
University (Graduate)	4,138
Private Trade Schools	1,665
Private Business Colleges	564
Community Colleges	1,665
Teacher Training	990
Ontario College of Art	773

Source: Ontario, Department of University Affairs,
Report of the Minister of University Affairs,
Toronto: Queen's Printer, 1967.

Ontario, Department of Education,
Report of the Minister of Education,
Toronto: Queen's Printer, Annual.

Canada, Dominion Bureau of Statistics,
Statistics of Private Trade Schools,
(81-214), Ottawa: Annual.

Statistics of Private Business Colleges
(81-213) Ottawa: Annual.

Information received from the Dominion Bureau of Statistics.

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